

## **Siemens We Can Change the World Challenge**

### **The Green Can Experience**

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#### **Suburban Challenge Project**

##### **Step 1: Choose It!**

Our state is not recycling enough, but you probably knew that. What you may not know is that recycling can actually create jobs, and our state is in need of them. Our team visited our local recycling authority and they stated that for every ton of waste recycled, nine jobs are created. Recycling negligence is happening in more than just our community. Continuing to throw away recyclables will hit our environment and economy hard. We intend to use our data to persuade the local community leaders to increase their recycling efforts. Our team plans on making recycling more economically efficient, easy and fun.

##### **Step 2: Research It!**

Too many bottles and cans are going into local landfills because recycling bins haven't been available in our community, even though our local governments provide recycling pick-ups. Our community has a recycling program, yet employees of city hall throw away recyclables even though they know the city receives money based on the amount of material collected. According to our local recycling authority, for every ton of recyclables they collect, nine jobs are created, while only one job is created if that same ton is landfilled. Once it is landfilled, the value of plastic is buried forever. Recycled plastic can be made into new items. For example, in 1999 Ford Motor Company used more than 60 million 2-liter plastic soda bottles to make grille reinforcements, window frames, engine covers, and trunk carpets for its new vehicles, according to The Energy Information Administration.

Plastic bottled water is the most consumed drink, but the least recycled container. Experts at The Container Recycling Institute suggest that single-serve sizes are prone to being littered, and have a lower recycling rate than any of the most common packaging materials. Our local recycling authority offers, "The truth is that we are all living beyond our planet's means. We are consuming natural resources faster than the planet can replenish them. It cannot remain this way forever... The question is how long can we remain out of balance with the Earth and its resources?"

### **Step 3: Plan It!**

We started our project by visiting our local recycling facility to learn about recycling. Next, we will go to our local hardware store to purchase our materials. Afterward, we will cut small circular holes in the tops of the bins to discourage trash and attach labels identifying them as recycling bins. We will put a recycle bin in a local school for two weeks. For the first week, we will not tell students about the presence of the bin. Then, the first day of the second week, we will put up posters in the vicinity of the bins and make announcements about the bin. Simultaneously, we will put our second bin at city hall for a week without informing them. The following week, we will place informational posters above the bin. However, due to city hall's meeting schedule, we will make announcements during the third week. We will repeat this process at the police department. During the weekend we will station a control bin near a soccer field with no opportunity for education. Each day we will check the bins to see how many bottles and cans we collect and record the data. Our objective is to scientifically determine if the number of cans and bottles increases after the active education. Our team's hypothesis is that the verbal announcements and posters will increase the amount of recyclables more than the bins alone.

#### **Materials:**

- Two 32-gallon garbage bins with lids
- Labels: Recycle Bottles and Cans Only
- Garbage bags
- Informational posters customized for students or adults
- Announcements customized for students or adults

#### **Procedure:**

- First ask permission to place bin in designated area.
- Prepare the bin and label it clearly.
- Put the bin in place.
- Collect the bottles and cans and record the data.
- Then after the first week, begin the education process. Put up posters and make announcements.
- Continue to collect recyclables and record data.
- Analyze the data.

#### **Step 4: Do It!**

We decided to make our own recycling bins. Purchasing them from our local hardware store, we cut circles in the tops, big enough for a bottle, but small enough to discourage trash. We labeled them as recycling bins, asking for cans and bottles only.

Knowing it was necessary to test adults and students, we asked for permission to put our recycle bins in our local city hall, police department, and two of our local middle schools. On Monday, October 20<sup>th</sup>, we deployed the bins. We did not tell people about the bins, to see if we would get collect any bottles and cans. Our hypothesis is that we will collect more cans and bottles in the second and third weeks, after we educate people about the bins.

The second week, we made announcements and put up posters educating people about the positives of recycling and the negatives of not recycling. We continued to collect the cans and bottles and saw an increase in numbers. During the first week, without any education or telling students about the bin, we collected a total of 147 cans and bottles. The second week, we finished with 574 cans and bottles. That was the week we educated students, Halloween parties occurred, and 335 seventh grade students went on a field trip. On an average day, about 973 students use the cafeteria.

#### **Middle School Cafeteria**

	Oct 20 <sup>th</sup>	Oct 21 <sup>st</sup>	Oct 22 <sup>nd</sup>	Oct 23 <sup>rd</sup>	Oct 24 <sup>th</sup>	Oct 27 <sup>th</sup>	Oct 28 <sup>th</sup>	Oct 29 <sup>th</sup>	Oct 30 <sup>th</sup>	Oct 31 <sup>st</sup>
<b>Bottles</b>	13	14	15	21	12	29	32	40	81	35
<b>Cans</b>	9	11	16	25	11	60	60	65	65	47
<b>Total</b>	22	25	31	46	23	89	92	105	206	82
<b>Percentage</b>	2.26	2.57	3.19	4.73	2.36	9.15	9.46	10.79	21.17	12.37

As a control, we placed a bin near the soccer fields, at another local middle school, during the weekend soccer matches. Both adults and students had equal opportunity to use this bin. In this test, we found that, with no window for education (control), people will recycle very little. We also found that if the bin isn't convenient, people won't use it.

#### **Middle School Soccer Field – Control**

Day of the Week	Date	Cans	Bottles
Saturday	10/25/08	0	0
Sunday	10/26/08	1	1

During the first week testing the adults, we secretly placed the bins, with no prior notice that it was going to be there. We checked the bins every day and recorded the data. The second week, we put up posters near the bins explaining the positive facts about recycling and the negative effects of not recycling. We checked the bins daily and recorded the data. Upon the final week, we made an educational announcement highlighting the bin and recorded this data as well.

### **Place Recycle Bin at City Hall**

Day of the Week	Date	Cans	Bottles	Recycling %
Monday	10/20/08	1	0	4%
Tuesday*	10/21/08	0	2	7%
Wednesday	10/22/08	1	0	4%
Thursday	10/23/08	0	1	4%
Friday	10/24/08	0	0	0%

### **Recycle Bin at City Hall with Posters (Passive Education)**

Day of the Week	Date	Cans	Bottles	Recycling %
Monday	10/27/08	0	0	0%
Tuesday	10/28/08	0	0	0%
Wednesday	10/29/08	1	3	18%
Thursday	10/30/08	0	0	0%
Friday	10/31/08	1	0	4%

### **Recycle Bin at City Hall with Posters and Announcement (Active Education)**

Day of the Week	Date	Cans	Bottles	Recycling %
Monday*	11/03/08	1	3	14%
Tuesday	11/04/08	0	2	9%
Wednesday	11/05/08	0	4	18%
Thursday	11/06/08	1	1	9%
Friday	11/07/08	2	9	50%

\* Normally twenty-two people, at meetings the number increases to twenty-eight.

**Place Recycle Bin at Police Department**

Day of the Week	Date	Cans	Bottles	Recycling %
Monday	11/10/08	0	2	9%
Tuesday	11/11/08	0	2	9%
Wednesday	11/12/08	0	2	9%
Thursday	11/13/08	0	3	14%
Friday	11/14/08	0	3	14%

**Recycle Bin at Police Department with Posters (Passive Education)**

Day of the Week	Date	Cans	Bottles	Recycling %
Monday	11/17/08	0	2	9%
Tuesday	11/18/08	0	2	9%
Wednesday	11/19/08	0	4	18%
Thursday	11/20/08	0	5	23%
Friday	11/21/08	0	3	14%

**Recycle Bin at Police Department  
with Posters and Announcement (Active Education)**

Day of the Week	Date	Cans	Bottles	Recycling %
Monday	11/24/08	1	6	32%
Tuesday	11/25/08	0	3	14%
Wednesday	11/26/08	0	8	36%
Thursday	11/27/08	0	3	14%
Friday	11/28/08	1	4	23%

\* Normally twenty-two officers and staff.

## **Step 5: Analyze It!**

Just as we predicted, our results proved our hypothesis that the verbal announcements and posters will increase the amount of recyclables more than the bins alone. We collected more cans and bottles after we “educated” the people about the recycle bin. On the second week, our team collected 574 cans and bottle from the local school, as opposed to the 147 cans on the first week. The second week the school had Halloween parties and the seventh grade went on a field trip, affecting our results. At city hall, we collected 5 bottles and cans the first week, but 28 bottles and cans in the second and third weeks. While at the police department, we collected 12 bottles and cans in the first week, and 42 bottles and cans in the second and third weeks. (Due to the meeting schedule at city hall and the police department, we hung posters in the second week and made the announcements during the third week.) We found that the placement of the bins is essential. When we placed the bins, with no education, we received a small number of bottles and cans, compared to the number of people. The posters (passive education) increased the count slightly, but making the announcements (active education) had a profound impact. We also noted there are many individual trashcans in the office area and fewer in a normal middle school cafeteria. The police share an open office with convenient centrally located recycling bin much like the school. This led us to believe that if the bin is not convenient the people won’t use it. What confirmed this is that when we put the bin away from the soccer field, people didn’t use it. Many people say time is money, but here’s the truth: garbage is money, too.

## **Step 6: Share It!**

Our project was totally worth it. It was fun to see how the community reacted to the bins. Initially, we were disappointed with the number of cans and bottles the city hall and police department were recycling, until we looked at the actual percentages which we realized were high. Our team went to the middle school’s green club, after we finished recording the data. We talked to them and explained what we did and our data. The green club’s leaders told us, that they filled out 15 of 20 points for state green school rankings, and once they fill out the paperwork, the school will receive emerald status. The higher the school’s status, the more funding from the State they will get. If you want to help your community, you should consider putting the recycling bins next to all the trashcans in the area as a reminder to recycle (on the go). Get people involved; talk to you local city hall, police departments, and elected officials about the topic; write press releases; and try and help the schools go green. We sent press releases to two local newspapers. We presented to our elected officials at Walled Lake City Council and the Oakland County Board of Commissioners Planning and Building Committee where our report was officially received and filed. We also plan to go to our State Capital and Washington D.C. We will present our data and pitch the idea of putting recycle bins in public areas and updating our current bottle deposit laws.